



Date: 2022-10-17

File / dossier : 6.02.04

Edocs pdf : 6892456

**Written submission from the  
Canadian Nuclear Association**

**Mémoire de l'Association  
nucléaire canadienne**

**CNSC staff update on elevated  
hydrogen equivalent concentration  
discovery events in the pressure  
tubes of reactors in extended  
operation**

---

**Mise à jour du personnel de la  
CCSN sur les événements liés aux  
découvertes de concentrations  
élevées d'hydrogène équivalent dans  
les tubes de forces de réacteurs en  
exploitation prolongée**

---

Commission Meeting

Réunion de la Commission

November 3, 2022

Le 3 novembre 2022

October 17, 2022

Canadian Nuclear Safety Commission  
c/o Louise Levert, Secretariat  
280 Slater St. PO Box 1046  
Ottawa, Ontario K1P 5S9

**Re: Canadian Nuclear Association Intervention regarding elevated hydrogen equivalent concentrations in pressure tube of reactors in extended operation**

The Canadian Nuclear Association (CNA) has approximately 100 members, representing over 70,000 Canadians employed directly or indirectly in exploring and mining uranium, generating electricity, advancing nuclear medicine, and promoting Canada's worldwide leadership in science and technology innovation.

As the Commission knows, the Canadian nuclear industry's number one value is safety and the CNA and its members recognize that the discovery of elevated hydrogen equivalent concentrations in pressure tubes is an important issue and one that industry is committed to applying the resources and research necessary to address.

The CNA would note that the issue is focused on reactors in extended operation and that reactors that have undergone refurbishment and have new pressure tubes are not impacted. However, the CNA also notes that the CNSC staff took regulatory action requiring Bruce Power, NB Power and OPG to report on pressure tube fitness for service and actions taken in response to the event.

Canada's nuclear operators have a long history of sharing OPEX and working together to address issues. This is no exception. An industry roadmap outlining activities to improve Heq predictions was developed, and an Oversight Committee was created to oversee the roadmap. In addition, task teams were created to identify gaps in areas such as model development, user requirements and experiments and data.

Nuclear operators have increased surveillance and monitoring activities such as investigating the root cause of the elevated Heq, introduced operational changes and increased training to minimize cold overpressure transients and compliance with cooldown and depressurization operating envelopes. In addition, industry has identified various research and development plans to update predictive model capabilities and analytical tools for the rolled joint region of pressure tubes. Throughout this process, industry has kept CNSC staff fully informed of all activities and developments.

When assessing the risk created by elevated hydrogen equivalent, it is important to note that staff have previously concluded that there was no impact on the ability of process and safety systems to mitigate the consequences of a pressure tube failure due this issue. Pressure tube failure is a design-basis event



for CANDU reactors, which have built-in mitigating safety systems. In addition, pressure tube failure is accounted for in probabilistic safety analysis which show safety goals are met with sufficient margin.

The CNA has reviewed Bruce Power and OPG's submissions as well as staff's Commission member document and we support staff's determination that through risk informed decision making, the increase in risk is negligible for continued operation up to three years which provides industry the time to complete additional research to confirm that safe operation of pressure tubes is sound

Please feel free to contact me directly should you have questions or require additional information.

Sincerely,



Steve Coupland  
Director of Regulatory and Environmental Affairs  
Canadian Nuclear Association